

# **BEST PRACTICES** for Asset Condition Management™

## **Bently Nevada defines machinery management as:**

A modern methodology to proactively optimize the productivity, long-term reliability, and maintenance costs of machinery over the plant life-cycle that provides real-time, or near real-time, feedback to the personnel responsible for the operating conditions acting on the machine. It includes:

**Collection** of relevant process and machinery condition data through an online system that can be used both locally and remotely;

**Correlation** of this data to understand the relationship between machinery stress, machinery malfunctions, and operating conditions;

**Conversion** of this data to Actionable Information® directed to the responsible people to act upon;

**Communication** of this information to the right people, at the right time, and in the right format. This occurs well before reaching alarm levels used by plant operations to manually or automatically shut down or remove the machine from service.

By substituting the word “asset” for “machinery,” you obtain an equally valid definition that captures the essential elements of properly managing **any** plant production asset. It necessitates the following capabilities in the Asset Condition Management™ module of a Plant Asset Management System:

### **Real-time and online**

**It is well-known that assets do not wear out linearly.** They typically undergo periods of unusual stress, sometimes due to abnormal process conditions, during which a single hour of operation can introduce stress equal to thousands of hours of wear-and-tear under normal conditions. Intermittently checking an asset does not always catch problems in time; or, if it does, it may be able to identify what failed, but not why it failed. Industry is increasingly recognizing that the new standard is online, real-time asset measurements, just as it has long-ago embraced real-time process measurement and control. In fact, for a system to meet the ARC

Advisory Group's\* definition of PAM, it must employ online, real-time technology for data collection and analysis.

### **Feedback**

While it will always be necessary to provide information to **maintenance** personnel so they can fix identified asset problems, it is a relatively new realization in many plants that the **operators** are an equally important audience for asset condition information. Why? Because the **operators are in the unique role of being able to change process conditions, in real time, to prevent the asset from breaking in the first place.**

As mentioned, assets often wear out in a greatly accelerated manner simply because they are stressed by abnormal process conditions. In the words of one of our customers, **"Pumps don't die, they're killed."** The same can be said for many other assets, not just pumps. We have numerous examples of how our machinery condition monitoring systems have been used by operations personnel to change process conditions to prolong the life of an asset, without any detrimental effect on process throughput or quality. Without such information, the process would have happily chugged along while inadvertently strangling the life out of the asset. Thus, the ability for an asset management system to provide real-time measurements and real-time feedback are essential for success.

## Correlation

Plant assets always interact with the process in some fashion. **Only by understanding the relationship between asset condition and process conditions can many root causes be isolated.**

Is the asset being killed by the process? Is the process not the problem, but is it being adversely affected by the asset's performance? These questions can only be answered when the asset management system has the ability to correlate process data with asset condition data. This is why integration between the Asset Condition Management and Process Control Systems is so vital – it enables two of the most important aspects of asset management to occur: 1) correlation with condition measurements through the importation of process data to the Asset Condition Management module; 2) feedback to operators by exporting condition information to the Process Control System display consoles.

## Actionable Information®

**This is where the real value in an asset management system is delivered.** All the integration in the world and the ability to access reams of data from multiple systems in an integrated user interface provides very little value in an age where

decisions must be made rapidly. **Today's plants want to "manage by exception" through the use of intelligent advisories and status annunciation.** They don't want to examine every bit and byte, plot and printout – there simply aren't enough people or hours. They expect their systems to turn data and measurements into plain-language advisories that identify what and where the problem is, how severe it is, and what to do about it. Bently Nevada coined the term "Actionable Information®," and it is now being routinely used to describe the kind of output people want from an asset management system. It is also important to note that for a system to be useful, its ability to generate Actionable Information must be automated and real-time. Many systems purporting to provide "Decision Support<sup>SM</sup>" and "Actionable Information" do not do so in an automated fashion – data must be manually fed into the system and an audit of the data must be initiated manually. In contrast, Bently Nevada's Decision Support capabilities generate Actionable Information automatically at time-based intervals, upon alarm events, or using other user-configurable criteria. When assessing various aspects of a PAM system and its components, it is vital to ensure that the Asset Condition Management module is capable of providing Actionable Information automatically and in real time. Further, it is essential that users be able to customize this aspect of the system by embedding their own rules and knowledge.

## Communication

This relates very closely to our discussion regarding feedback to operators. However, the audiences interested in output from an Asset Condition Management and PAM system extend well beyond operators. They include maintenance and reliability personnel, plant management, suppliers, and others. Bently Nevada has trademarked the phrase **"Actionable Information to the Right People at the Right Time®"** to convey this important concept. It is a central feature of our Condition Monitoring systems – particularly System 1<sup>TM</sup>. ORBIT

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\* *Plant Asset Management and Condition Monitoring Worldwide Outlook, Market Analysis and Forecast through 2005*, published May 2001 by ARC Advisory Group, Dedham, MA ([www.arcweb.com](http://www.arcweb.com))